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ABSTRACT

This paper discusses developments in information and communications technologies and their impact on university libraries. Topics addressed include: (1) background, including the Information Revolution, the Knowledge Economy, implications for education and information services, and responses to the challenges of globalization; (2) university libraries, including the role of libraries; (3) challenges of electronic information, including the shift to electronic publications and the creation of appropriate information architectures; (4) information skills, including provision of comprehensive and up-to-date training; (5) pedagogical change, including the dialog between teachers and librarians; (6) research, including provision of access to scholarly information and relevant data; (7) intellectual property, including policy and legislation, the ownership and use of copyrighted material, and the implications of the trend toward licensing; (8) infrastructure, including the implementation of increasingly integrated information resource access systems and adoption of knowledge management; and (9) technological university libraries. (MES)

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IATUL

AFTER THE FIREWORKS: OPPORTUNITIES AND DIRECTIONS FOR UNIVERSITY LIBRARIES

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BACKGROUND

We live in a time in which the rate of change is unprecedented. While the nineteenth century saw tremendous innovations in technology, communications and public health that changed our lives during the twentieth century, we are now seeing a global transformation of social organisation. The dramatic technological developments both in information and communications technologies and in biotechnologies will continue to transform our lives but not, in themselves, as profoundly as the nineteenth century clusters of innovation in:

- electricity
- the internal combustion engine and transportation
- chemicals and materials
- entertainment, communication and information
- health and sanitation [1]

Instead, the "Information Revolution" is accelerating the rate of change as it pushes us faster into the 'Knowledge Economy'. That is, into the emerging world economy in which the greatest asset is intellectual capital, the knowledge which gives one organisation or one nation, or a partnership of organisations or nations, an advantage over others. Such an advantage may be found in the relatively new information industries or in the older extractive and transforming industries. For example, 50% of the world's mines use software developed in Australia, which has dramatically increased their productivity. Taiwan has become rich and influential as a manufacturer of the equipment used in the information industries: they have applied North American and European ideas to product development and are in the process of moving their manufacturing operations to mainland China [2].

As Castells [3] notes, the new paradigm has five characteristics:

1. *information is its raw material*, the technologies act on information not just information acting on technology;
2. the *pervasiveness* of the effects of the new technologies which are shaping all processes of our individual and collective existence;
3. the *networking logic* or topology which is well adapted to increasing complexity of interaction and to unpredictable patterns of development, and can be implemented in all kinds of processes and organisations;
4. *flexibility* in which all processes are reversible and organisations and processes can be reconfigured,

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in a society characterised by constant change and organisational fluidity; and,
5. the growing *convergence* of specific technologies into a highly integrated system merging separate technological trajectories.

Thus, the information and communications technologies are both a product and signifier of that 'Knowledge Economy' and also facilitate acceleration of the rate of change. In common with other parts of the globe, but heightened by its previous isolation, nineteenth century Australia was radically transformed by the fast communication of news, commerce and personal matters following the completion of the Overland Telegraph and its connection to the British Australian Telegraph undersea cable at Darwin. The immediate global access offered by the Internet and the World Wide Web is similarly, but much more rapidly and extensively, transforming global commerce, international relations and the lives of individuals. The 304 million users of the Internet around the world can have immediate (or nearly immediate, bandwidth and "HTTP Error 404 Not Found" allowing) access to an enormous range of information. While we know the access is not without its problems, they are overshadowed by both its benefits and its potential, if only we can realise effective and efficient access in a universal and democratic fashion.

These developments have profound implications for education and for the world's information services. When information fuels the knowledge economy, libraries and information services are the carburetors and fuel injectors which make the information available when and where it may be required. In education we have moved from imparting a relatively fixed corpus of knowledge to an emphasis on skills, understanding and collaboration. In history, for example, the narratives of kings and queens, wars and conquests, inventions and discoveries have been replaced by the application of the techniques of investigation, analysis and synthesis. At all levels of education students are required to work in teams to investigate questions and develop understandings while absorbing the worth and skills of collaboration.

In higher education, rapid change is being driven by the catchcries of 'lifelong', 'open' and 'flexible' learning and the opportunities offered by 'eLearning'. Many universities are also considering the threats or opportunities posed by educational programs offered by or through powerful global entertainment corporations such as News Limited and Disney.

The rapidity of the change has been demonstrated by recent developments. A 1998 report noted, in discussing what it called the 'Death Star' scenario, "the involvement of global media networks in providing higher education has been overstated, ... [but some] companies are seeking to establish a presence as a carrier, rather than a provider, of educational content" [4].

However, two months ago, the Universitas 21 international consortium of 18 universities, including three Australian universities, entered into an agreement with Mr Rupert Murdoch's News Corporation to form a joint venture company to secure a substantial share of the global higher education market. Mr Murdoch welcomed the move, saying: "News Corporation has taken a strategic decision to enter the distance learning market using our global distribution platforms, our advanced technologies and our marketing reach. A mutually profitable partnership between leading providers in higher education and one of the world's leading media companies is a very strong proposition." [5]

Besides the emphasis on the profit motive, this initiative illustrates two responses to the challenges of globalisation. Firstly, the formation of *international industry alliances*: just as most of the major world airlines are linking themselves into the One World and Star Alliance camps, we see early signs of global university alliances. And, secondly, *partnerships to facilitate delivery* with powerful media and communications corporations. A third response, apparently not included in this initiative, is seen in *workplace based education and training arrangements* between universities and corporations (eg Deakin University and Coles Myer).

UNIVERSITY LIBRARIES

These developments and trends place university libraries in the spotlight as many of the issues centre around our business: information and knowledge. Not only do they concern the matters usually discussed in the context of the knowledge economy, mentioned above, but also the key questions of who, where, when and how? Who are (will be) the students? Where will they learn? When and how?

Will they have the skills to learn effectively in a networked environment? To what extent are those skills, the generic 'information skills' crucial to our students' futures, not only skills necessary to learn in an online world?

Of course, it is a truism to note that university libraries have evolved considerably from the wonderful Aladdin's caves of bibliographic treasures, typified by the Bodleian, Bibliothèque de Sainte Genevieve, Yale and many others to the information access services of today. Many have speculated about the creation of 'virtual' university libraries and some have reported on their initiatives such as Schmidt's description of the 'Cybrary' at the University of Queensland [6]. But we do not need a new name: the university library is still the place to go to get information to support study, teaching and research. Many of the processes and some of the functions have changed, but the purpose of university libraries remains. The 'place' that our clients visit is no longer only, or even primarily, the edifice comprising a box of books, study areas and services. Yale's telling inscription "This is not the Library, the Library is within" has acquired new resonance: "This is not the Library, the Library is with you". The information and knowledge that our clients use is not longer primarily found on paper. Our clients, however, still come to us to find information and knowledge: we continue to facilitate and mediate their access.

The traditional role of university libraries as the *holders* of scholarly information has diminished. In many fields, but not all, it is no longer necessary for students and researchers to travel physically to specific libraries which hold the resources necessary for their investigations. They can point and click to access remotely but this does not mean that the library has lost its importance. Far from it, the library is needed to bring together the services and make them available, with assistance, to clients while ensuring that licences are respected and invoices paid. It is needed to ensure relevance and appropriateness of information resources to facilitate the achievement of each university's particular goals.

THE CHALLENGES OF ELECTRONIC INFORMATION

The challenges posed by the shift to electronic publications are far from trivial. The questions of access, licensing, costs, and preservation have exercised our minds within our own institutions, through consortia and internationally. In this period of flux, there is much uncertainty. Both university libraries and our partners in publishing, database development, distribution and communication have many issues to address.

Not least among these is the creation of appropriate information architectures. Lately, we have seen much about portals and their importance to eCommerce, replacing the voluminous literature on gateways. But we, as information professionals, know that it is the entire information architectures which must be addressed. In this we move from our longstanding expertise in creating buildings for information related purposes to architecture in the sense of creating information structures which will store and make appropriately accessible digital information.

Behind these immediate issues are our traditional concerns with preservation and archiving. They include endeavours to establish deposit collections of digital publications in Portugal [7] and the National Library of Australia's attempt to "catch the rainbow" through archiving Australian content on the World Wide Web [8] and similar initiatives elsewhere in the world.

Many of the solutions to these challenges lie in collaboration. The development of consortia, often from pre-existing cooperative groups, has improved our bargaining position and brought some consistency to the market place.

INFORMATION SKILLS

One of the most important issues for higher education and for university libraries in particular is the efficient and effective provision of comprehensive and up to date information skills training. Not only is this vital for effective use of the modern academic library but the skills imparted form an essential element of the attributes expected of the graduates of our universities.

In my view such information skills training must be delivered in a variety of ways, employing flexible delivery, to meet the varied needs of our clients. There is no 'one size fits all' in information skills training. However, it is clearly of the utmost importance that the training be seen to be and be relevant

and timely. This can best be done by integrating information skills training into the curriculum. Through that strategic approach, students will value the training and benefit from its immediate application.

PEDAGOGICAL CHANGE

Our direct involvement in education goes much further. Traditionally, in many universities long seen as 'support services', university libraries are now being recognised as ever more integral to learning and research within higher education. Through that recognition, we can play an essential role in the refocusing of universities towards flexible, open and career long learning.

Pedagogical development demands continuing dialogue between teachers and librarians with emphases on client autonomy, information skills and the attributes of graduates through continual innovation. Through such conversations, librarians are engaging with the core of higher education and the necessary emphasis on quality.

RESEARCH

In supporting research through the provision of access to scholarly information and relevant data, libraries have extended into the laboratory and out to the field, providing tailored services in situ. In this respect many of the challenges can be summarised in Ranganathan's dictum "save the user's time".

But, as mentioned above, we must also assist researchers and particularly research students, the researchers in training, to develop their skills in acquiring and using information.

INTELLECTUAL PROPERTY

Many of these areas of concern have brought in their train greater consideration of the implications of intellectual property legislation and policy. We need to be concerned about the intellectual property issues related to the so called "Crisis in Scholarly Communication", the ownership and use of copyright material in our universities, and the implications of the trend towards licensing. Wider societal issues include the consideration of the moral rights of creators and the particular positions of indigenous peoples.

Technological convergence, mentioned above, is exacerbating many of these issues. The consequence has been nervousness and the resultant paralysis of many publishers and media distributors as they fear losing control of their content in a digital environment.

Similar fears of loss of control underlie the recent preoccupation with the control of 'offensive' content on the Internet, a preoccupation that has significantly plagued Australia, as well as some other countries. It has raised the serpent of censorship, which had been somewhat dormant in civilized nations.

INFRASTRUCTURE

University librarians must also guide infrastructure development, the implementation of increasingly integrated information resource access systems and the consequent adoption of knowledge management. There are a host of issues to be addressed in regard to the provision of adequate and accessible bandwidth to enable our students to learn. To that must be added workstations, information commons and other facilities. In developing nations there is a need for basic infrastructure: buildings and well stocked collections managed and supported by well trained staff.

TECHNOLOGICAL UNIVERSITY LIBRARIES

I must not finish without special reference to our libraries, the libraries of technological universities. Should we call them "technological university libraries" or "libraries of universities of technology"? I prefer the latter. Our universities have special characteristics and our libraries reflect them. While I do expect our libraries to have a strong technological focus, they share that with many other contemporary university libraries. Our libraries are distinguished by their focus on the interests of universities of technology: the focus on practice and the workplace. Thus we need not only consider the use of information resources in learning, teaching, research and scholarship but also its use in business, industry and professional practice.

CONCLUSION

There are of course many external influences, some of which I have touched upon in this paper. They include globalisation, multilingual and multicultural challenges, media developments and eWorld opportunities. However, the traditional emphases on ethics, professionalism and objectivity, and on cooperation and collaboration remain crucial as does our responsibility to think globally, endeavouring to address the implications for those in both developed and developing nations.

In closing, I wish to note the importance of IATUL and its capacity to further develop as a network of the world's libraries of universities of technology.

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Back to Contents

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